

## **MULTIMODE OPTICAL FIBERS HAVING INCREASED BANDWIDTH**

### **[[ Related Application**

This application is a division of application Serial No. 027067, filed December 20, 2001, now US Patent No. 6,735,985, issued May 18, 2004. **]]**

### **Field of the Invention**

This invention relates to multimode optical fibers having increased bandwidth.

### **Background of the Invention**

Manufacture of state of the art multimode optical fiber requires demanding control over a variety of power loss and signal impairment mechanisms. For multimode fiber, controlling mode dispersion is an important goal.

As is well known, within the optical fiber, bits of data are represented by pulses of light. Each pulse of light will spread, or disperse, over time as it travels the length of the fiber. If these data pulses overlap, they can no longer be unambiguously read at the receiving end. Lower tendency toward data pulse overlap results in higher data transmission capacity, i.e. higher bandwidth. Therefore, the bandwidth of optical fibers is ultimately limited by dispersion.

Predominant forms of dispersion are chromatic dispersion and mode dispersion. Chromatic dispersion is well known and occurs in all optical fiber systems. Mode dispersion, or intermodal dispersion, occurs mainly in multimode optical fibers where the large core diameter allows a wide number of optical paths for light to travel. Different optical paths usually have different lengths. Because the modes travel along paths of varying length, they arrive at the fiber end at different intervals of time. If the time difference is great enough, the pulse traveling the faster path will overlap the pulse ahead of it.